

# Math 5615 Honors: Problem-Solving Session

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December 7, 2020

# Plan for Today

I would like you to split into three-person breakout rooms. Before splitting into breakout rooms, I will be giving you problems. Within your breakout room, you will do some brainstorming and group work and create solutions.

You will be getting your class point just for participating in the breakout rooms for the whole duration of class.

I will be visiting the breakout rooms to answer questions, give you hints, and accept your solutions.

# Forming Breakout Rooms

Tell me via chat (make it personal, if you wish) the names of classmates in your study group, if you are in one. I will take that information into account and assign you to a breakout room. I cannot promise I will satisfy everyone's request, but I will try to.

In your three-people breakout room, you will play rotating roles:

**The Host** One person leads the talking within the group. Not that the other should shut up: that person will play the role of host, organizer, and mediator.

**The Scribe** One person writes it up: on a piece of paper or in a file.

**The Speaker** One person presents the report to me, when the report is ready.

# Problem 1

Why do we see each other in the mirror with the left and right sides switched but not upside down?

## Problem 2

Suppose you take a map of Minneapolis on a square piece of paper, take a smaller,  $1/10$  scaled photocopy of it and throw it on the original map so that the the smaller map lies entirely inside the larger. Prove that you can take a pin and puncture through a location on the smaller map which will be the same location on the larger map. How many locations like that do you expect to find?